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AUTHOR Cruttenden, Alan
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ABSTRACT

The evidence on the acquisition of intonation by children is reviewed. Reports on the early use of pitch contours fall into two categories, imitational and differential intonation. While imitational intonation is based on mimicry of adults, differential intonation involves the acquisition of two or three tunes that contrast in meaning from an early age. The acquisition of innate falls, later tunes, and intonation comprehension is discussed. From the limited available evidence, it is concluded that the use of some forms of intonation is present even during the babbling stage, that the use of intonation to convey some of the same meanings conveyed by adult language is also present from an early age, and that children over the age of 10 years are still developing toward the complexity of adult intonation patterns. Even adults develop highly varying levels of intonational competence and continue to develop new intonational skills. References are appended. (RW)

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How Long Does Intonation Acquisition Take?

Alan Cruttenden
University of Manchester

IMITATIONAL intonation

Reports on the early use of pitch contours by children fall into two groups which I shall call (a) IMITATIONAL and (b) DIFFERENTIAL. I deal firstly with the IMITATIONAL. It is clear that most babies are excellent mimics of pitch contours. Nakazima (1962) found babies mimicking adult pitch contours at the age of eight months; while E. Pike (1949) found that by making rising tunes predominate in her own speech, she could make them also predominate in her child's speech. In the babbling of my own twins, I noticed them seizing on particular adult pitch patterns and repeating them endlessly in the last quarter of the first year, e.g., one child played with a pattern of high level followed by mid level. At first this pattern was used in simple mimickry but later it became limited to occasions when her mother might have said all gone with the same pattern. Halliday's Nigel (Halliday, 1975), between 0;9 and 1;6, seemed to learn each new meaningful expression as if it had its own particular tonal pattern, e.g., [a:] (with a rise-fall involving a rise from mid to high and back again) "Yes, I want what you have just offered;" and [˩˧˥] ("narrow low") "I'm sleepy." Here it is as if the child thinks he is learning a tone language, but with the additional complication that he has not realized that a tone language will be reasonably limited in the number of tones that it uses. Also under the heading of IMITATIONAL come the sort of phenomena recorded in Peters (1977) where one child (aged 1;2) had learned a number of pitch patterns with relatively specialized meanings, and where "each of the phrases has a 'melody' unique enough so that it can be recognized even if rather badly mumbled," e.g.,

pitch	adult expression	meaning
[¯ _]	uh oh	"trouble coming!"
[_ ˋ]	look at that	(pointing)
[¯ _ -]	oopsidaisy	"accident"

What is characteristic of all the uses of pitch so far discussed is that the children concerned imitate whole pitch patterns with considerable detail and precision. Such usage of pitch patterns may originate in simple mimickry without any meaning (as in Nakazima, 1962). But many children go on to attach

such patterns very rigidly to particular segmental word-like sequences, e.g., Halliday's (1975) Nigel. Yet other children may clearly have learned a number of words which have a regular segmental pattern but at the same time use very characteristic pitch patterns on various series of syllables which contain almost random segments, e.g., Peters (1977), who, in addition to the sort of examples quoted above, goes on to show the same child using pitch patterns of sentence length in a similar way.

DIFFERENTIAL intonation

The other type of report on intonation acquisition which is frequent in the literature concerns those cases where two tunes (or occasionally three) are said to contrast in meaning from a very early age, and, at least by implication, this intonation contrast is potentially possible on all or at least a very large number of utterances. Engel (1965/1973) suggests that babies as young as 0;4 have two tunes: rising for requests and desires; and falling for pointing and for answers. Leopold (1947:255) reported that his daughter Hildegard had two tunes around the age of 1;3: a rise for requests and a high (sometimes falling) pitch for demonstratives and to show interest. Dore (1975) recorded three contrastive intonations on the word mama: falling for labelling, rising for questioning, and rising-falling for calling. Finally, Halliday (1975) reported that his child developed a distinction between rise for "pragmatic," i.e., requests, and fall for "mathetic," i.e., labelling, during the early part of his two-word stage around 1;5. All these various authors report at least one intonational contrast (usually between a simple fall and simple rise) but the age at which the contrasts are reported as established varies widely from 0;4 to 1;5.

IMITATIONAL and DIFFERENTIAL intonation

Thus in the early stages of language learning there appear to be two very different strategies in intonation learning which in wider terms can be seen as the difference between item-learning and system-learning (Crutt[illegible]den, 1981). In the case of Peters's (1977) Minh, the two types of intonation learning went on side by side whereas in the case of Halliday's (1975) Nigel, item-learning preceded system-learning. But whenever and however the two types of strategy are integrated, it must surely be clear that children have in no sense "mastered" the adult intonation system at the one-word stage.

Innate Falls

A falling tune is consistently reported as the more basic tune; rises have to be learned for special purposes (e.g., Wells, Montgomery and MacLure, 1979). An important problem lies behind this assumption of the falling tune as basic. This is the fact

that some dialects of English (and certainly some other languages) do not appear to make the extensive use of the fall vs. rise distinction which Received Pronunciation and American English do. Two examples are: (a) Belfast English, where rising tunes very much predominate, and where the number of falls is very limited (Jarman and Cruttenden, 1976); and (b) Tyneside English, which has many more levels and rises than Received Pronunciation (Pellowe and Jones, 1977). The question which arises in the face of such dialects is: is a falling tune in some sense innate and the basic starting-point for all children, regardless of the situation in the adult dialect? Or is what the child learns purely governed by the parental input? The fact that children are generally such excellent mimics of intonation would suggest the latter.

There is a small amount of relevant evidence concerning the acquisition of intonation in Tyneside English. Local (1980) records the changes in frequency of falls, rises, levels, and other nuclear tunes among six Tyneside children around the ages of five and six. Figures for one typical boy (Paul) and one typical girl (Claire) are as follows:

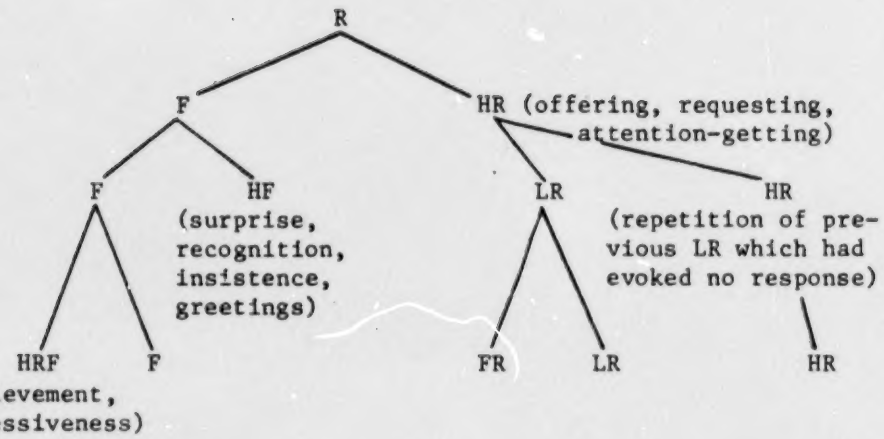
	Paul			Claire		
	F.	R.	L.	F.	R.	L.
Stage I	55%	25%	5%	53%	25%	5%
Stage II	48%	12%	15%	46%	19%	11%
Stage III	35%	13%	26%	31%	39%	12%

It is clear from this that at the first stage (around 5;0) both Paul and Claire are using predominently falls but by the third stage (around 6;0) rises and levels together outnumber falls (which is the position in adult Tyneside). This of course does not prove that falls are in some sense innate, since it may be that Tyneside parents talk differently to very young children than they do to other adults. As an aside it is worth remarking that levels are more frequent than rises among Tyneside men but rises more frequent than levels among Tyneside women, and this distribution of tunes appears to have been achieved by the age of six. But as regards the problem of innate fall or not, the evidence is undoubtedly suggestive although not conclusive; for myself, I would still not underrate the effect of parental input.

Later Tunes

When we look for further details concerning the later development of the intonational system of children, reports are sparse. Crystal (1979) suggests an order of acquisition of tunes based on Halliday (1975), Menn (1978), and one child he himself studied. The order suggested is approximately as in the following tree (where Crystal noted recorded meanings, I have added

them):



Such an order of acquisition is obviously highly tentative. Indeed it may represent nothing very much at all, given that the data base was only three children, and given that there is likely to be considerable variation in the order of acquisition of tunes. Even if such development were complete at the early age which Crystal suggests (under 2;0), and even though it represents a complexity of tunes which at least approaches the adult system, it is still very clear that the very wide range of meanings conveyed by adult intonation is not yet present. (Nor of course do we know what has happened to the pitch patterns dealt with under IMITATIONAL above.)

Intonation Comprehension

Very little is known about children's developing comprehension of intonation. Their early competence at mimicking pitch patterns mentioned above suggests that there is usually no problem about learning the actual forms of intonation. This is confirmed by Kaplan's (1969) finding that babies at eight months can discriminate between typical adult statement and question intonations. The problem lies rather in the understanding of the meanings attached to intonation patterns. In this area there have been only a few pilot studies. Iannucci and Dodd (1980) tested children's comprehension of the variation in the scope of quantifier negation produced by the use of falling vs. falling-rising intonation, i.e.,

(a) `All the rabbits aren't in their cages. (None are)
(b) ˇAll the rabbits aren't in their cages. (Some are)

The meaning of sentence (b) was understood only by 58% of children in grade 7. The use of fall-rise in this sentence is an example of its general meaning of "reservations," highlighted in

this case by a precise grammatical effect. Although there may be a "local effect" specifically connected with all, the results of the experiment suggest that the "reservations" meaning of fall-rise may not be understood until the teens. So, for example, younger children may not pick up the meaning implicit in ˇJohn didn't succeed (. . . but Philip did). A similarly slow development of the comprehension of intonational meaning was shown in my own experimental study (Cruttenden, 1974) of children's understanding of football results. As is well known, the reading of results involving two teams can often be done in such a way that the result can be anticipated before the score of the second team is actually read (at least in British English), e.g., ˇLiverpool two/ˆBirmingham . . . (the accent on Birm indicates nothing new to follow--hence the second score is also two). In my experiment boys aged seven through nine (almost all of whom were football fanatics) were asked to guess the second score when it was left out. At least 50% of boys aged nine showed nothing approaching complete competence. The intonation of football results is merely one special case involving the use of intonational patterns which are more generally used throughout the language. What evidence there is thus suggests that children in their early school years will miss many of the meanings conveyed by intonation. For example, such children may not understand the implications of many teacher responses when conveyed by intonation alone, e.g., the different attitudes of ˊreally (surprised query); ˎreally (bored); and ˆreally (impressed).

Conclusion

In summary, the evidence available from the limited evidence concerning the acquisition of intonation suggests the following:

(a) (i) The use of some of the forms of intonation is present from a very early age (almost certainly during the babbling stage).
    (ii) A very restricted use of intonation to convey some of the meanings conveyed by intonation in the adult language is also present from an early age (for some children as early as late babbling).

(b) The understanding (and probably the use) of anything approaching the typical complexity of adult intonation patterns is still developing in children aged ten-plus.

Even adults probably develop highly varying levels of intonational competence. We must all have noticed varying levels of ability at reading aloud and I suspect that many of us continue to acquire new intonational skills even as adults. Let us have no more talk about the acquisition of intonation being over before the first words are uttered.

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